

REMARKS

Claims 2-11 are pending.

Claims 2-5, 9-11 stand rejected for anticipation by Heinzl, et al.

Claims 6,8 stand rejected for obviousness v. Heinzl in view of Xu.

Claim 7 stands rejected for obviousness v. Heinzl in view of Miyazawa, et al.

Claim 2 is currently amended to incorporate limitations of the previous claim 8.

Claims 3-6, 8-11 are currently amended to clarify differences between this application and the cited references so as to put the claims in condition for allowance.

Claim 7 is herein canceled.

Basis: The basis for amendments to claims 2-6, 9-11 is found in the previous claims, and in

FIG. 1-3. The basis for amended claim 8 is found on page 4, line 20.

In response to the Office Action:

Regarding Items 2,3 the rejection of claims 2-5,9-11 for anticipation by Heinzl:

Applicant has carefully considered the Office Action, and respectfully traverses Examiner's arguments that claims 2-5, 9-11 of the instant invention are anticipated by Heinzl, for several reasons which the claims have been amended to clarify.

Anticipation requires that the cited reference contain *all* of the elements and limitations of the instant invention. Applicant respectfully submits that Heinzl lacks several elements and/or limitations present in currently amended claims of the instant invention. For example, claim 2 of the instant invention has:

- 1) a chamber having a *negative* internal pressure; and
- 2) a spraying plate having a plurality of gradually *widening* holes thereby
- 3) *allowing* air backflow to enter the chamber in order to balance the internal pressure.

In addition, dependent claim 6 adds a further limitation of simultaneously having *two* types of spraying holes, (also claiming a plurality of gradually narrowing holes to increase spraying pressure). Finally, dependent claim 8 adds the limitation that the spraying holes are made of microstructures.

Applicant respectfully submits that Heinzl has none of these limitations, disclosing:

- 1) *no limitation* of negative internal pressure (in fact, according to Peng (col. 1, line 58-61), the apparatus of Heinzl 6116517 "can be used only as a constant closed valve, but cannot be used as a pump", i.e. it must have *positive* internal pressure to be functional;
- 2) spraying holes which are straight, or, preferably, gradually *narrowing* holes (col.10, lines 28-30, for example, also see FIG. 1-13a); and
- 3) allowing *no* air backflow to enter the chamber (col. 2, line 53, and col. 8, line 57, for examples).

When rejecting claim 5, Examiner states that the apparatus of Heinzl will "automatically draw in air and thusnegative pressure in the chamber is regulated".

Applicant finds no such reference in Heinzl, instead Heinzl states that the openings 5a, at the edges of the transducer are sized so that "no air is pulled into the nozzles in the chamber" (col. 2, lines 47-54, also col. 8, lines 50-58, for example). Reconsideration of the anticipation rejection of claims 2,5 is respectfully requested.

With respect to claim 6, Heinzl does not disclose the simultaneous use of two different spraying hole geometries to achieve different objectives, as in the instant invention. With respect to claim 8, Heinzl does not disclose making the spray holes from microstructures.

Applicant respectfully submits that Heinzl does not contain all of the elements and limitations of the amended claims of the instant invention, and does not meet the threshold requirements for an anticipation rejection.

Reconsideration of the anticipation rejection is respectfully requested.

Regarding Items 4-5, the rejection of claims 6,8 for obviousness v. Heinzl in view of Xu:

Obviousness rejection requires that the cited references, in combination, contain *all* of the elements and limitations of the instant invention. In addition there must be a “clear and particular” suggestion, originating in the prior art, to combine the references in a manner that would produce the instant invention.

Applicant respectfully submits that the combination of Heinzl in view of Xu, does *not* have all the elements and limitations of the instant invention, and therefore does not meet the threshold requirements for an obviousness rejection of the instant invention. In addition, an adequate suggestion from the prior art is lacking.

The combination of Heinzl in view of Xu lacks some of the same elements and limitations lacking in Heinzl, that were noted above. First, the Xu fuel injector valve is inherently a positive pressure device, although at lower fuel pressure than “high pressure systems” of the prior art. In addition, the Xu fuel injector valve discloses no allowance of air backflow into the supply chamber, being designed to “seal the supply passage 18” (col. 2, lines 14-17). Further, while Xu does have orifice holes 26 which are conical and are gradually widening, all the orifice holes 26 in the nozzle plate 24 are the same, i.e. there is no disclosure of using two different orifice hole geometries simultaneously, as in claim 6 of the instant invention. Also, Xu does not disclose spraying holes made of microstructures, as in instant claim 8. Thus, a combination of Heinzl in view of Xu must lack the following features of the instant invention:

- 1) a chamber having negative pressure;
- 2) allowance of air backflow to balance the negative pressure;
- 3) a spraying plate simultaneously having two different types of spraying holes; and
- 4) spraying holes made of microstructures.

Finally, Applicant finds, in the cited prior art, no “clear and particular” suggestion to combine in a manner so as to produce the instant invention. Rather, the motivation to

combine cited by the Examiner appears to originate from the instant invention, and therefore represents hindsight reconstruction.

Reconsideration of the obviousness rejection of claims 6,8 is respectfully requested.

Regarding Items 6, the rejection of claim 7 for obviousness v. Heinzl in view of Miyazawa:

Claim 7 is herein canceled, however, the subject matter of gradually narrowing spraying holes, when used in combination with gradually widening spraying holes, is incorporated in instant claim 6. Applicant respectfully submits that the use of gradually narrowing spraying holes in combination with gradually widening spraying holes is not disclosed in the combination of Heinzl and Miyazawa.

Applicant believes that this amendment answers all instances in which the Examiner rejected or objected, and that the amendment places all remaining claims in condition for allowance.

CONCLUSION

In view of the foregoing, Applicant believes all claims now pending in this application are in condition for issue. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at (408) 358-0489.

Respectfully submitted,



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